

Unit 5 Part 2: Practice Check 36

1. The diameter of a spherical ball is 18 inches. A circle is painted around the ball so that its center is 3 inches from the center of the sphere.

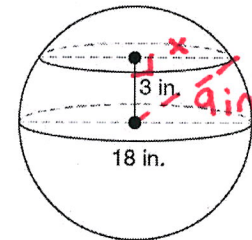
What is the circumference, to the nearest tenth of an inch, of the painted circle?

- A. 17.7 in
 B. 26.7 in
 C. 53.3 in
 D. 59.6 in

$$C = 2\pi r$$

$$C = 2\pi(\sqrt{72})$$

$$C \approx 53.3 \text{ in}$$



$$9^2 = 3^2 + x^2$$

$$x^2 = 72$$

$$x = \sqrt{72}$$

2. In terms of π , what is the surface area of a hemisphere whose diameter is 16 cm, including the base?

- A. $128\pi \text{ cm}^2$
 B. $192\pi \text{ cm}^2$
 C. $256\pi \text{ cm}^2$
 D. $512\pi \text{ cm}^2$

$$SA = 2\pi r^2 + \pi r^2 \quad r=8$$

$$= 3\pi r^2$$

$$= 3\pi(8)^2 = 192\pi \text{ cm}^2$$

3. The circumference of the great circle of a sphere is 16π cm. What is the surface area of the sphere, in terms of π ?

$$16\pi = 2\pi r$$

$$r = 8 \rightarrow SA = 4\pi(8)^2$$

$$= 256\pi \text{ cm}^2$$

The surface area is 256π cm^2 .

4. Which of the following expressions will lead to the correct formula for the volume of a hemisphere?

- A. $2\pi r^3 - \frac{2}{3}\pi r^3$
 B. $2\pi r^3 - \frac{1}{3}\pi r^3$
 C. $\frac{2\pi r^3 - \frac{2}{3}\pi r^3}{2}$
 D. $\frac{2\pi r^3 - \frac{1}{3}\pi r^3}{2}$

$$\rightarrow \frac{\frac{4}{3}\pi r^3}{2} \leftarrow \text{Volume of a sphere}$$

5. A sphere has a radius of 9 cm. What is the volume of the sphere in terms of π ?

- A. $108\pi \text{ cm}^3$
 B. $972\pi \text{ cm}^3$
 C. $2916\pi \text{ cm}^3$
 D. $5832\pi \text{ cm}^3$

$$V = \frac{4}{3}\pi(9)^3$$

$$= 972\pi \text{ cm}^3$$

6. Three hemispheres with radii measuring 2 cm, 3 cm, and 4 cm, respectively, are melted and reshaped to form a sphere.

What is the radius of the new sphere to the nearest tenth of a centimeter?

- A. 3.7 cm
- B. 4.4 cm
- C. 4.6 cm
- D. 7.0 cm

$$\begin{aligned} 2 \text{ cm} &\rightarrow \frac{\frac{4}{3} \pi (2)^3}{2} \approx 16.8 \text{ cm}^3 \\ 3 \text{ cm} &\rightarrow \frac{\frac{4}{3} \pi (3)^3}{2} \approx 56.5 \text{ cm}^3 \\ 4 \text{ cm} &\rightarrow \frac{\frac{4}{3} \pi (4)^3}{2} \approx 134.0 \text{ cm}^3 \end{aligned} \quad \left. \vphantom{\begin{aligned} 2 \text{ cm} \\ 3 \text{ cm} \\ 4 \text{ cm} \end{aligned}} \right\} \text{Total} = 207.3 \text{ cm}^3$$

$$207.3 = \frac{4}{3} \pi r^3$$

$$r \approx 3.7 \text{ cm}$$